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**POLYMER SOLUBILITY EXPERIMENTATION:
ASTM D3132 TEST REPORT
DATABASE DOCUMENTATION**

VOLUME I

DEC QUALITY INSPECTED 4

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RESEARCH AND TECHNOLOGY DIRECTORATE

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13. ABSTRACT (Maximum 200 words) The fundamental polymer-liquid solubility experiment is the starting point for most investigations of polymer-liquid interactions. A laboratory computer data base has been designed for the rigorous documentation of experimental conditions and solubility observations. The structure, record and field definitions, and system use have been documented.				
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PREFACE

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**POLYMER SOLUBILITY EXPERIMENTATION:
ASTM D3132 TEST REPORT
DATABASE DOCUMENTATION**

VOLUME 1

INTRODUCTION

The rigorous recording and documentation of research data is critical to the scientific process. The initial experiment in polymer-liquid interaction research is often the polymer solubility determination. For those experiments that yield thermodynamically stable solutions, there is usually further experimentation on the specimen solution. Sample tracking and history are often important to follow-on experiments on rheological, desorption, or other properties. A detailed logbook-notebook system was established over the last decade of research on polymer-liquid interactions. The requirement to transition these experimental methods to collaborative or production testing laboratories resulted in the need to convert the hardcopy documentation system to an automated, paperless system for direct data file transfer to a mainframe materials database. The system devised and documented here employs a laboratory PC database that is structured in ASTM E49 compatible computer format as the Test Report section to ASTM D3132. The scope herein is limited to the documentation of a users' and programmers' guide.

PROCEDURES

The design goal was to employ only menu selectable structures that were auto-generated; no dbase or SQL code was used. All calculations were executed employing the Calculated Field capability by Functions and Expressions at the Report Design screen.

Herein, a record is defined as a single combination of one polymer and a liquid(s) at one concentration or ratio. Different concentrations are entered into different records.

The ASTM D3132 Test Report operates as an electronic notebook at a level that is much simpler than either our menu-driven ASTM E1308 (Standard Guide for Identification of Polymers in Computerized Materials Property Databases) or a typical Laboratory Information Management System (LIMS). The ASTM D3132 Test Report is structured as a one-column and ca 30 row flat file with five additional entries for each observation interval up to four.

RESULTS

Guide to Test Report Database

Figures 1-4 are examples of the blank laboratory logbook-notebook forms used previously and the replacement blank database forms. The data fields are cross-referenced by numbers showing the corresponding fields and their location on the computerized database versus the laboratory logbook-notebook form. For example, Item 1, Figure 1 is identified as "Sample Number" and this value is now Keyed into Item 1, Figure 2 as "Log Number."

(Test Name & Number:) 3 5
35 gm/dl of 7 in 13 Date OBSE - DATE1
 Polymer Solution Preparation and Measurements: Sample Number 1
Measurement:
 Rheometry
 LVN; dilute
 Viscosity, Conc
 TG, Evap
 Breakup
 Other
 Collaborators
 Rheological Measurement Conditions:

Solution Preparation

Bottle, Polymer, &
 Liquid 1 wt: 26 gm.
 Bottle, Polymer wt: 24 gm.
 Bottle wt: 23 gm.
 Polymer wt: 25 gm.
 1st Liquid wt: 27 gm.
 Bottle, Polymer, &
 Liquid 2 wt: 28 gm.
 2nd Liquid, (dye etc,
 if any) wt: 29 gm.
 Polymer & Liq wt: 30 gm.
 Wt% = (Polymer/
 Polm & Liq) X 100 wt: 36 gm.
 Wt Ratio = (Polymer/
 Liq) X 100 wt: 37 gm.
 Density of Liq 1 wt: 31 gm.
 Density of Liq 2 wt: 32 gm.
 Volume of Liq 1 = wt
 Liq/dens wt: 33 gm.
 Volume of Liq 2 = wt
 Liq/dens wt: 34 gm.
 g/dl = (Polymer wt/liq
 vol) X 100 wt: 35 gm.

MIXING DATES, OBSERVATIONS,
 AND COMMENTS

Starting Data: OBSE - DATE1
 Observations
 OBSE-PHAS1
 OBSE-VISC1
 OBSE-CLAR1
 OBSE-POLY1
 OBSE-CODE1
 MEMO

Figure 1. Polymer Solubility Experiment Log Book Test Report Form;
 Fields Keyed to Computer Data Base Test Report

D3132 DATA ENTRY FORM

1 Log Number	:	LOT_NUMBER	
2 Operator	:	OPERATOR	
3 Type of Test	:	TESTTYPE	
4 ASTM Test Method	:	ASTM_TEST	
5 Date of Standard	:	DATE_STAND	
6 Pub Source of Data	:	PUB_SOURCE	
7 Polymer	:	POLYMER	
8 Structural Descript.	:	ATTRIBUTES	
9 Polymer ASTM Code	:	ASTM_CODE ASTM E1308 #4 : Family Abbrev. Code
10 Polymer Lot #	:	POLY_LOT ASTM E1308 #18a : Traceability Lot
11 Polymer Manufacturer	:	POMANUFACT	
12 ASTM E1308 Link	:	E49LINK	
13 Liquid 1	:	LIQUID1	
14 Liquid 1 CAS #	:	LIQUID1CAS	
15 Liquid 1 Lot #	:	LIQUID1LOT	
16 Liquid 1 Manufacturer	:	L1MANUFACT	
17 Liquid 1 Purity, wt%	:	LIQUID1PER	%
18 Liquid 2	:	LIQUID2	
19 Liquid 2 CAS #	:	LIQUID2CAS	
20 Liquid 2 Lot #	:	LIQUID2LOT	
21 Liquid 2 Manufacturer	:	L2MANUFACT	
22 Liquid 2 Purity, wt%	:	LIQUID2PER	%
23 Bottle Weight	?	BOTTLEWT	grams
24 Bottle, Polymer	?	BOTTLE_POL	grams
25 Polymer Weight	=	POLY_WT	grams
26 Bottle, Polymer, Liquid 1	?	BOT_PL1	grams
27 Liquid 1 Weight	=	LIQUID1WT	grams
28 Bottle, Polymer, Liquid 1 & 2	?	BOT_PL1L2	grams
29 Liquid 2 Weight	=	LIQUID2WT	grams
30 Polymer & Liquid 1 & Liquid 2	=	POLYL1L2	grams
31 Density of Liquid 1	?	DENSITYL1	g/mL
32 Density of Liquid 2	?	DENSITYL2	g/mL
33 Volume of Liquid 1	=	VOL1	mL
34 Volume of Liquid 2	=	VOL2	mL
35 Conc., g/dL, Grams per Deciliter	=	G_PER_L	
36 Conc., Weight Percent	=	WT_PERCENT	%
37 Conc., Weight Ratio	=	WT_RATIO	

Figure 2. Polymer Solubility Experiment Data Input Form for Polymers and Liquid

Observation Codes:

Phases : 1, 2

Viscosity: V = Viscous, U = Unchanged viscosity

Clarity : C = clear, Hl = Hazy-low, Hh = Hazy-high

Polymer Sorption Levels

: U = Unchanged, L = Low, M = Medium, H = High, A = All

Observation No.1 Date ? *OBSE_DATE1* Solution Time : 0

Phases	Viscosity	Clarity	Polymer Sorption
<i>OBSE_PHAS1</i>	<i>OBSE_VISC1</i>	<i>OBSE_CLAR1</i>	<i>OBSE_POLY1</i>

Code ? *OBSE_CODE1*

Remarks? *memo*

Observation No.2 Date ? *OBSE_DATE2* Solution Time : *SOL_TIME2*

Phases	Viscosity	Clarity	Polymer Sorption
<i>OBSE_PHAS2</i>	<i>OBSE_VISC2</i>	<i>OBSE_CLAR2</i>	<i>OBSE_POLY2</i>

Code ? *OBSE_CODE2*

Remarks? *memo*

Reversal? *RFLAG1*

Observation No.3 Date ? *OBSE_DATE3* Solution Time : *SOL_TIME3*

Phases	Viscosity	Clarity	Polymer Sorption
<i>OBSE_PHAS3</i>	<i>OBSE_VISC3</i>	<i>OBSE_CLAR3</i>	<i>OBSE_POLY3</i>

Code ? *OBSE_CODE3*

Remarks? *memo*

Reversal? *RFLAG2*

Observation No.4 Date ? *OBSE_DATE4* Solution Time : *SOL_TIME4*

Phases	Viscosity	Clarity	Polymer Sorption
<i>OBSE_PHAS4</i>	<i>OBSE_VISC4</i>	<i>OBSE_CLAR4</i>	<i>OBSE_POLY4</i>

Code ? *OBSE_CODE4*

Remarks? *memo*

Reversal? *RFLAG3*

Observation No.5 Date ? *OBSE_DATE5* Solution Time : *SOL_TIME5*

Phases	Viscosity	Clarity	Polymer Sorption
<i>OBSE_PHAS5</i>	<i>OBSE_VISC5</i>	<i>OBSE_CLAR5</i>	<i>OBSE_POLY5</i>

Code ? *OBSE_CODE5*

Remarks? *memo*

Reversal? *RFLAG4*

Solution Time Days : *TOTALDAY*

Observation Code : *OBSE_PHASFL = OBSE_VISCFOBSE_CLARF/P = OBSE_POLYF*

Solubility Class : *SOLUBILITY*

Remarks : *memo*

Figure 3. Polymer Solubility Experiment Data Input Form
for Recording Observation Codes

Polymer	:	Hydrocarbon Resin,, Piccopale 100
Liquid 1	:	2-chloroethyl methyl sulfide (CEMS)
Liquid 2	:	
Solubility Classification	:	S
Observation Code	:	1L=VC
Solution Time, Days	:	16
Conc., g/dL	:	16.5
Conc., Weight Ratio	:	14.9
Conc., Weight Percent	:	12.9
ASTM E1308 Link	:	
Log Number	:	93-055
Type of Test	:	Polymer-Liquid Solubility
ASTM Test Method	:	D3132
Date of Standard	:	1990
Pub Source of Data	:	
Polymer ASTM Code	:	
Polymer Lot #	:	Hercules C5C1250
Liquid 1 CAS #	:	542-81-4
Liquid 1 Lot #	:	ALH 18053-5
Liquid 1 Purity Wt%	:	97.0%
Liquid 1 Density	:	1.11 g/mL
Liquid 2 CAS #	:	
Liquid 2 Lot #	:	
Liquid 2 Purity Wt%	:	0.00%
Liquid 2 Density	:	0.0000 g/mL

Figure 4. Polymer Solubility Experiment Summary Form

Overview of Database Entry

The database prompts and record field definitions are reported in Figure 5 and generally follow the Data Form sequence in Figures 2 and 3. The "Definitions" in Figure 5 have sufficient detail to document the recorded fields. The formal data base structure is listed in Figure 6. (Note that the sequence does not follow the prompt form in Figure 2-3.) The first column in Figure 6 is the field number corresponding to the item number in Figure 5. The second column contains the formal Field Name (10 characters). The "Type" column contains the definition of the type of data item to be entered into the field. The "Width" column contains the number of characters or numbers. The number of decimal places is defined in the "Dec" column, for numeric floating point numbers. The Memo Field description is in the last column and is titled "Full Description of Field."

Some overall guidelines are provided below.

Field Prompt	Definition
Log Number	Two digit year (e.g., 1993 = 93) and the experiment number separated by a hyphen. (e.g., 93-001 is the 1st experiment at the database site in the year 1993).
Date	Month/day/year (the two-digit month and year) when the polymer and liquid were combined (i.e., when the experiment started.)
Operator	Person making the measurements and the observations.
Polymer	Polymer chemical name (e.g., polystyrene)
Polymer Lot#	Lot number manufacturer gave the polymer when it was manufactured.
Polymer Manufacturer	Manufacturer of the polymer.
Liquid 1	Chemical name of the 1st liquid added.
Liquid 1 CAS #	Chemical Abstracts Service registry number.
Liquid 1 Lot#	Lot number manufacturer gave the liquid.
Liquid 1 Manufacturer	Manufacturer of the liquid.
Liquid 1 Purity	Purity of the liquid by specification or reanalysis.
Liquid 2	Chemical name of the 2nd liquid added (if any).
Liquid 2 CAS #	Chemical Abstracts Service registry number.
Liquid 2 Lot#	Lot number manufacturer gave the liquid.
Liquid 2 Manufacturer	Manufacturer of the liquid.
Liquid 2 Purity	Purity of the liquid by specification or reanalysis.
Bottle Weight	Weight of the bottle, cap, label, and anything else that would go on the bottle before the polymer and liquid are added.
Bottle, Polymer	Weight of the bottle plus the polymer.
Polymer Weight	Weight of the polymer only. This is calculated using program BOTPOLY.PRG.

Figure 5. Field Prompts and Definitions for the Polymer Solubility Experiment Database

Field Prompt	Definition
Bottle, Polymer, Liquid 1	Weight of the bottle, the polymer, and the 1st liquid.
Liquid 1 Weight	Weight of the liquid only. This is calculated by the computer using program LIQ1WT.PRG.
Bottle, Polymer, Liquid 1 & Liquid 2	Weight of the bottle, the polymer, the 1st liquid, and the 2nd liquid, if any. If there is only one liquid, then enter "0" into this space.
Liquid 2 Weight	Weight of the 2nd liquid, if any. This is calculated by the computer for you using program LIQ2WT.PRG.
Polymer, Liquid 1 & Liquid 2	Combined weight of the polymer, the 1st liquid, and the 2nd liquid without the bottle. This is calculated using program PL1L2.PRG.
Density of Liquid 1	Density of the 1st liquid. If it is not known, then enter "1." If the density of the liquid is obtained later, enter and recalculate.
Density of Liquid 2	Density of the 2nd liquid. If there is none, enter "0."
Volume of Liquid 1	Volume of the 1st liquid. It is calculated using program VOLL1.PRG.
Volume of Liquid 2	Volume of the 2nd liquid. It is calculated using program VOLL2.PRG.
Conc., g/dL	Concentration of the polymer in the liquid. This is calculated using program GDL.PRG.
Conc., Weight Ratio	Weight ratio of polymer to the liquids. This is calculated using program PERCENT.PRG.
Conc., Weight Percent	Polymer weight divided by polymer, liquid 1 & liquid 2 weight. This is calculated using program RATIO.PRG.
Solubility Classification	Enter either an "S" if the polymer is soluble or an "I" if it is insoluble.
Code	Refers to the observation codes. E.g., 2L=UC/P=U means 2 phases, unchanged viscosity, and clear with the polymer also being unchanged.

Figure 5. Field Prompts and Definitions for the Polymer Solubility Experiment Database (Continued)

Field Prompt	Definition
Remarks	Observations that cannot be noted elsewhere on the form. Hold the "Ctrl" and "Home" keys at the same time to access the edit screen. Hold the "Ctrl" and "End" keys to save what you have typed in the edit screen.
Solution Time	Time interval from the first observation made when the experiment was started to the latest observation. This is calculated for up to 4 intervals using 4 different programs titled TIME1.PRG, TIME2.PRG, TIME3.PRG, and TIME4.PRG.
Solution Time, Days	Time interval from the first observation made when the experiment was started to the last observation. This is calculated using program TOTALDAY.PRG.
Observation Code	Code for the latest observation. The computer finds the latest code for the summary using program CODEX.PRG.

Figure 5. Field Prompts and Definitions for the Polymer Solubility Experiment Database (Continued)

Structure for database: C:\DBASE\D3I32\D3I32LOG.DBF					
Number of data records: 154					
Date of last update : 08/18/94					
Field	Field Name	Type	Width	Dec	Full Description of Field
1	LOT_NUMBER	Numeric	6		Experimental log/lot number
2	OPERATOR	Character	20		Operator name
3	POLYMER	Character	100		Polymer name
4	POLY_LOT	Character	15		Lot number of polymer
5	LIQUIDI	Character	50		1st Liquid name
6	LIQUIDILOT	Character	9		Lot number of 1st liquid
7	LIQUIDICAS	Character	11		CAS number of 1st liquid
8	LIQUID2	Character	50		2nd Liquid name
9	LIQUID2LOT	Character	9		Lot number of 2nd liquid
10	LIQUID2CAS	Character	11		CAS number of 2nd liquid
11	BOTTLEWT	Numeric	8	4	Weight of bottle
12	BOTTLE_POL	Numeric	9	4	Weight of bottle & polymer
13	POLY_WT	Numeric	8	4	Weight of polymer
14	BOT_PLI	Numeric	8	4	Weight of bottle, polymer, & 1st liquid
15	LIQUIDIWT	Numeric	8	4	Weight of 1st liquid

Figure 6. Data Base Structure for the Polymer Solubility Experiment Test Report

<u>Field</u>	<u>Field Name</u>	<u>Type</u>	<u>Width Dec</u>		<u>Full Description of Field</u>
16	BOT_PLIL2	Numeric	8	4	Weight of bottle, polymer, 1st & 2nd liquids
17	LIQUID2WT	Numeric	8	4	Weight of 2nd liquid
18	POLYLIL2WT	Numeric	8	4	Weight of polymer, 1st & 2nd liquids
19	DENSITYLI	Numeric	6	4	Density of 1st liquid
20	DENSITYL2	Numeric	6	4	Density of 2nd liquid
21	VOLI	Numeric	8	4	Volume of 1st liquid
22	VOL2	Numeric	8	4	Volume of 2nd liquid
23	G_PER_L	Numeric	6	3	Grams of polymer per deciliter of liquid/s used
24	WT_PERCENT	Numeric	6	3	Weight of polymer to polymer & liquid %
25	WT_RATIO	Numeric	6	3	Weight ratio of polymer to liquid
26	OBSE_DATEI	Date	8		Date of 1st observation
27	OBSE_PHASI	Character	1		Number of phases
28	OBSE_VISCI	Character	1		Viewing Viscosity Code
29	OBSE_CLARI	Character	2		Clarity Code
30	OBSE_POLYI	Character	1		Poly/liquid Sorption Code
31	OBSE_CODEI	Character	10		Combined codes
32	OBSE_REMI	Memo	10		Remarks
33	OBSE_DATE2	Date	8		Date of 2nd observation
34	SOL_TIME2	Numeric	3		Number of days between the 1st & 2nd observations
35	OBSE_PHAS2	Character	1		Number of phases
36	OBSE_VISC2	Character	1		Viscosity Code
37	OBSE_CLAR2	Character	2		Clarity Code
38	OBSE_POLY2	Character	1		Poly/liquid Sorption Code
39	OBSE_CODE2	Character	10		Combined codes
40	OBSE_REM2	Memo	10		Remarks
41	RFLAGI	Logical	1		Flag indicating reversal from previous observation
42	OBSE_DATE3	Date	8		Date of 3rd observation
43	SOL_TIME3	Numeric	3		Number of days between the 1st & 3rd observations
44	OBSE_PHAS3	Character	1		Number of phases
45	OBSE_VISC3	Character	1		Viscosity Code
46	OBSE_CLAR3	Character	2		Clarity Code
47	OBSE_POLY3	Character	1		Poly/liquid Sorption Code
48	OBSE_CODE3	Character	10		Combined codes
49	OBSE_REM3	Memo	10		Remarks
50	RFLAG2	Logical	1		Flag indicating reversal from previous observation

Figure 6. Data Base Structure for the Polymer Solubility Experiment Test Report
(Continued)

Field	Field Name	Type	Width	Dec	Full Description of Field
51	OBSE_DATE4	Date	8		Date of 4th observation
52	SOL_TIME4	Numeric	3		Number of days between the 1st & 4th observations
53	OBSE_PHAS4	Character	1		Number of phases
54	OBSE_VISC4	Character	1		Viscosity Code
55	OBSE_CLAR4	Character	2		Clarity Code
56	OBSE_POLY4	Character	1		Poly/liquid Sorption Code
57	OBSE_CODE4	Character	10		Combined codes
58	OBSE_REM4	Memo	10		Remarks
59	RFLAG3	Logical	1		Flag indicating reversal from previous observation
60	OBSE_DATE5	Date	8		Date of 5th observation
61	SOL_TIME5	Numeric	3		Number of days between the 1st & 5th observations
62	OBSE_PHAS5	Character	1		Number of phases
63	OBSE_VISC5	Character	1		Viscosity Code
64	OBSE_CLAR5	Character	2		Clarity Code
65	OBSE_POLY5	Character	1		Poly/liquid Sorption
66	OBSE_CODE5	Character	10		Combined codes
67	OBSE_REM5	Memo	10		Remarks
68	RFLAG4	Logical	1		Flag indicating reversal from previous observation
69	ASTM_CODE	Character	10		ASTM code of the polymer
70	E49LINK	Character	10		E49 Link to related fields in other databases
71	LIQUID2PER	Numeric	6	2	Purity of 2nd liquid, %
72	LIQUID1PER	Numeric	6	2	Purity of 1st liquid, %
73	SOLUBILITY	Character	2		Solubility classification (S, I, SB, SI)
74	TESTTYPE	Character	60		Standard Test title
75	ASTM_TEST	Character	5		Test code (i.e., D3132)
76	DATE_STAND	Character	4		Year Test reapproved
77	PUB_SOURCE	Character	60		Notebook Reference
78	TOTALDAY	Numeric	3		Duration of exp. (days)
79	ATTRIB	Character	100		Attributes
80	OBSE_PHASF	Character	1		# of phases in final obse.
81	OBSE_VISCF	Character	1		Viscosity Code
82	OBSE_CLARF	Character	2		Clarity Code
83	OBSE_POLYF	Character	1		Poly/liquid Sorption
84	CODE	Character	10		Combined codes
85	L1MANUFACT	Character	20		Manufacture of liquid No. 1
86	L2MANUFACT	Character	20		Manufacture of liquid No. 2
87	POMANUFACT	Character	20		Manufacture of the polymer
88	REMARKS	Memo	10		Remarks about the overall experiment
** Total **			925		

Figure 6. Data Base Structure for the Polymer Solubility Experiment Test Report
(Continued)

ASTM E49 guidelines for documenting polymer composition identification and test results are met specifically with Fields 3-12.

Nonqualitative or volumetric formulations can be recorded by entering single digit estimates for weights and volumes, then noting this in the "Remarks" field.

Concentration is calculated by all possible methods since other, collaborative investigators usually use different concentration conventions.

"Liquid 2" fields (Figure 2) can be used either to record the addition of dyes and stabilizers or to formulate a multicomponent solution (e.g., DS2).

Initiation of Database Entry

Note that the descriptions below use related sets of figures subtitled A, B, C. In each case, the procedures in "A" refer to the database screen in "B," which is executed from the screen in "C." To start the ASTM D3132 observation input database at the c:\> prompt (Figure 7A), type: **d3132**. Once the database is operating, one will see a menu screen (Figure 7B). If one needs to add or edit data, use the arrow keys to move the highlight bar to **NEWLOG** under the **Forms** column. Once **NEWLOG** is highlighted, press the Enter/Return key. A table similar to Figure 7C will appear. High-light/Enter **Display data** to initiate the data base program. The next screen appearing will be similar to Figure 2; this is the database input form for ASTM D3132.

Objective	Prompt	Click or Highlight + Enter or Type	Result
Start dbase 4 and d3132 Application Program	C:\>	d3132	Fig 1
Add or edit data	--	Newlog	Fig 2
Start database Application Program	--	Display data	Fig 3
Type in data	?	(See Table Field Definitions)	Not App
Calculate results based on input	=	None	Value output to screen

Figure 7A. Data Entry Procedures for Polymer Solubility Experimentation per ASTM D3132: Initiate Database Entry

Catalog Tools Exit

10:01:01 am

dBASE IV CONTROL CENTER

CATALOG: C:\DBASE\D3132\D3132.CAT

Data	Queries	Forms	Reports	Labels	Applications
<create> D3132LOG	<create>	<create> NEWLOG	<create> LOGRPT SUMMARY	<create>	<create>

File: New file

Description: Press ENTER on <create> to create a new file

Help:F1 Use:← Data:F2 Design:Shift-F2 Quick Report:Shift-F9 Menus:F10

Figure 7B. Menu Options for Initiating a New Test Report or Editing Previous Reports

Catalog Tools Exit

9:59:29 am

dBASE IV CONTROL CENTER

CATALOG: C:\DBASE\D3132\D3132.CAT

Data	Queries	Forms	Reports	Labels	Applications
<create>	<create>	<create>	<create>	<create>	<create>
D3132LO	Display data Modify layout Press ENTER to select or ESC to cancel				

File: NEWLOG.SCR

Description: D3132 Input Form

Select option and press ENTER, or press first letter of desired option

Figure 7C. Initiating Data Base Program for Polymer Solubility Experiment ASTM D3132

Test Report Entry

The prompts for each entry are provided in a hardcopy table (Figure 5) and are self-explanatory in most cases. Note that most information can be obtained from either the polymer or liquid bottle label (e.g., Liquid 1 Lot # and Liquid 1 Manufacturer). All values that require input from the user are denoted with a "?" after the description, and values that are calculated by the computer code have a "=".

Printing Procedure

To print the ASTM D3132 observation data sheets (Figure 8A), highlight **LOGRPT** under the **REPORTS** column. Strike the **Enter** key, and a screen (Figure 8B) will appear on the monitor. Highlight **Print report**, key **Enter**, and a screen will appear (Figure 8C). Highlight **Begin printing** to start printing the observation forms.

To print the summary form, highlight **SUMMARY** (Figure 7B) instead of **LOGRPT** and follow the same procedures as above. A sample of each report is shown. The **LOGRPT** (Figures 2 and 3) is two pages long, and the **SUMMARY** (Figure 4) is one page. Every form in the database is printed when this procedure is employed. For selective printing, use dB4 facilities.

SUMMARY

The fundamental polymer-liquid solubility experiment is the starting point for most investigations of polymer-liquid interactions. A laboratory computer data base has been designed for the rigorous documentation of experimental conditions and solubility observations. The structure, record and field definitions, and system use have been documented. This system also supports the goal of maintaining ISO Guide 25 standards.

Objective	Highlight-Return or Click	Result
To print a hardcopy of ASTM D3132 Test Report	LOGRPT	Fig 3
	Print report	Fig 4
	Begin printing	Hardcopy printed
To print a hardcopy of ASTM D3132 Summary Report	SUMMARY	Fig 3
	Print report	Fig 4
	Begin printing	Hardcopy printed

Figure 8A. Printing Procedure for Both Test and Summary Reports
for Polymer Solubility Experiment ASTM D3132: Printing
of All Reports in Database

dBASE IV CONTROL CENTER

CATALOG: C:\DBASE\D3132\D3132.CAT

Data	Queries	Forms	Reports	Labels	Applications
<create>	<create>	<create>	<create>	<create>	<create>
D3132LO	Print report Modify layout Display data Press ENTER to select or ESC to cancel				

File: LOGRPT.FRM

Description: Print out the entire contents of the D3132 Database

Select option and press ENTER, or press first letter of desired option

Figure 8B. Printing Menu Options for Polymer Solubility Experiment ASTM D3132

dBASE IV CONTROL CENTER

CATALOG: C:\DBASE\D3132\D3132.CAT

		Reports	Labels	Applications
<	Begin printing Eject page now View report on screen	<create>	<create>	<create>
D	Use print form {LOGRPT.prf} Save settings to print form ▶ Destination ▶ Control of printer ▶ Output options ▶ Page dimensions	LOGRPT SUMMARY		

File: LOGRPT.FRM

Description: Print out the entire contents of the D3132 Database

Position selection bar: ↑↓ Select: ←→ Leave menu: Esc
 Start printing, using current print settings

Figure 8C. Printing Menu for Polymer Solubility Experiment ASTM D3132